

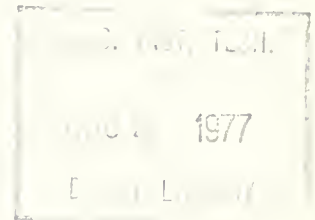




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INDUSTRIAL ADVERTISING EFFECTS AND  
BUDGETING PRACTICES: A REVIEW\*

Gary L. Lillen, Alvin J. Silk,  
Jean-Marie Choffray, and Murlidhar Rao

Sloan School of Management  
Massachusetts Institute of Technology

January 1975

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## ABSTRACT

Expenditures on industrial advertising (advertising of goods to non-consumer purchasers) amount to nearly a billion dollars annually. Firms that sell to industrial or reseller markets regularly face the problem of determining how much to spend for advertising their product. Typically these decisions are made on the basis of only limited information and analysis.

This report addresses two issues of importance in setting industrial advertising expenditure levels:

- (1) What is known about the effects of industrial advertising and the nature of the process whereby such effects are achieved?
- (2) How do firms presently set industrial advertising budgets?

A review of the available literature provides indications that:

- (1) industrial advertising and personal selling can perform complementary and/or synergistic roles;
- (2) increasing the share of total selling expense spent on advertising may be associated with lower selling costs relative to sales;
- (3) economies of scale may exist for industrial advertising.

These phenomena carry major implications for expenditure policy but the body of empirical evidence relating to them is presently very limited and can only be regarded as suggestive. The study of the process and effects of industrial advertising has not yet progressed to the point where it can offer much guidance to industrial advertisers faced with specific expenditure decisions.

This lack of knowledge about industrial advertising response is also evident when current advertising budgeting practices are examined. Two methods are commonly used in setting industrial advertising budgets: simple heuristics and the "task" method. Both approaches provide management with mechanisms for controlling advertising expenditures but can lead to inappropriate spending levels in many instances.

In summary then, current approaches to the problem of determining how much to spend on industrial advertising leave much room for improvement. Progress in this area requires a better understanding of how and under what conditions industrial advertising is effective. Possible directions for further work are briefly considered.



## Industrial Advertising Effects and Budgeting Practices

What is known about the effects of industrial advertising? This review article finds suggestive evidence of several phenomena which have important implications for budgeting practices.

The industrial sector has long been regarded as the neglected half of marketing in regard to the amount of research effort devoted to its problems. There are, however, indications that the situation may be changing. Research on industrial/organizational buying behavior is growing and a considerable body of empirical knowledge about processes surrounding the innovation and diffusion of industrial technologies and products has been developing that is highly relevant to marketers.<sup>1/</sup> This paper is concerned with a different set of issues, those surrounding the determination of expenditure levels for industrial advertising. Our purpose here is two-fold: (1) to review the available research relating to the effects of industrial advertising, and (2) to examine practices currently employed in budgeting industrial advertising in light of what is known about advertising response and costs in this field.

Estimates of total industrial advertising volume are hard to come by because of lack of relevant aggregate data and the vagaries of defining what constitutes "industrial advertising." Industrial advertising accounts for a small fraction of total U.S. advertising which reached \$25 billion in 1973

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<sup>1</sup>See, for example, Frederick E. Webster, Jr. and Yoram Wind, Organizational Buying Behavior (Englewood-Cliffs, N.J.: Prentice-Hall, 1972), and James M. Utterback, "Innovation in Industry and the Diffusion of Technology," Science, Vol. 183 (February 15, 1974), pp. 620-626.



but clearly the amount is substantial.<sup>2/</sup> N.W. Ayer estimates that industrial advertising totalled \$925 million in 1973.<sup>3/</sup> The business press, the major medium of industrial advertising, had a 1973 advertising volume of \$865 million.<sup>4/</sup> However, a considerable share of this was expended for products falling outside the ordinary definition of industrial goods and services -- e.g. pharmaceutical products.<sup>5/</sup>

Marsteller, chairman of one of the major advertising agencies in the industrial marketing field, estimates that there are 300-500 firms with annual industrial advertising budgets exceeding \$1 million.<sup>6/</sup> Surveys of industrial advertising budgets show that outlays for research have been running at about one percent of expenditures for several years.<sup>7/</sup> Considering that the top 100 national advertisers alone spent \$5.68 billion in 1973,<sup>8/</sup> one can readily appreciate why the cumulative body of studies bearing on industrial advertising effects appears so slight in comparison to that available relating to consumer advertising.<sup>9/</sup> Given its larger

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<sup>2</sup>Robert J. Coen, "Ad Volume in '74 Expected to Approach \$26.5 billion," Advertising Age, Vol. 45 (August 12, 1974), p. 3.

<sup>3</sup>N. W. Ayer & Sons, Inc. Industrial Advertising: Past, Present & Future (Philadelphia, Pa: N. W. Ayer & Sons, 1974), p. 1.

<sup>4</sup>Same reference as footnote 2, p. 53.

<sup>5</sup>"Business Press has 27,000 Advertisers," Advertising Age, Vol. 44 (November 21, 1973), pp. 104ff.

<sup>6</sup>William A. Marsteller, "Field of Industrial Advertising Gets More Competitive," Advertising Age, Vol. 45 (June 17, 1974), p. 23.

<sup>7</sup>See, for example, Sally Strong, "Ad Budgets '74: Trend is still to Spend, Spend, Spend," Industrial Marketing, Vol. 59 (February 1974), p. 57.

<sup>8</sup>Merle Kingman, "Top National Advertisers Hike Ad Total to \$5.68 billion," Advertising Age, Vol. 45 (August 26, 1974), pp. 1ff.

<sup>9</sup>Advertising Research Foundation, Measuring Payout: An Annotated Bibliography On The Dollar Effectiveness of Advertising (New York: Advertising Research Foundation, 1973).



funding base, consumer advertising research tends to be broader in scope and more sophisticated methodologically. The advertising budget for the industrial marketer is typically too small to justify or support the kind of research effort required to assess the impact of advertising in a manner that would yield information relevant to expenditure decisions. This condition contributes to the skeptical attitude many industrial executives hold toward advertising. Thus, advertising expenditure policy continues to be a perplexing problem for industrial marketing managers and it becomes important to ask what is known about the process and effects of industrial advertising and how that knowledge relates to current budgeting practices.

### Industrial Advertising Effects and Costs

Understanding the nature of advertising response is at the heart of the problem of budgeting expenditures for advertising. Here we present a selective review of empirical studies that have appeared in the marketing and related literature or otherwise have been publicly reported in sufficient detail to permit examination for information and clues about industrial advertising effects. The body of material that meets these criteria is quite small. Release of research undertaken by individual firms is rather infrequent except for brief, informal accounts that occasionally appear in the trade press. Arthur D. Little, Inc. and N. W. Ayer have both recently issued reports surveying the industrial advertising field.<sup>10/</sup>

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<sup>10</sup> Arthur D. Little, Inc., An Evaluation of 1100 Research Studies on the Effectiveness of Industrial Advertising, A report to American Business Press, Inc. (Cambridge, Mass.: Arthur D. Little, Inc., 1971), and Ayer, same reference as footnote 3.



The Arthur D. Little study claimed that 1100 studies were uncovered but many of the references listed dealt with consumer advertising research and only eight studies were singled out for detailed discussion -- and even one of these dealt with pharmaceutical advertising to physicians. The impression gleaned from those reviews as well as the present one is that, from a methodological viewpoint, the current state of industrial advertising research can be described as follows:

		Research Design	
		Correlational	Experimental
Measure of Response	Sales	Occasional	None?
	Attitude & Other Non-Sales	Most Common	Rare

While only a very limited amount of empirical research is available, some evidence exists which bears on each of the following important phenomena:

- (1) Economies of scale. Is there some region of expenditure in which additional increments of advertising yield increasing returns?
- (2) Threshold effects. Is there some minimum level of exposure which must be exceeded in order for advertising to have a discernible effect?
- (3) Interaction effects. Does advertising interact with other elements of the marketing mix (personal selling in particular) to produce effects that are greater than the sum of their separate effects?



## Sales Effects

The published literature is almost devoid of either correlational or experimental investigations of sales response to industrial advertising. A noteworthy exception is a regression analysis discussed by Weinberg.<sup>11/</sup> He developed a multiple equation corporate planning model that was applied to several industrial goods manufacturers. Weinberg reported that a sub-model of the system relating changes in a firm's market share to its "advertising exchange rate" (the firm's advertising expenditures per dollar of sales divided by the corresponding ratio for its competitors) had been successfully used in some of this work. He presented an example in which data consisting of seven observations for an unidentified glass container manufacturer were used to estimate the relationship between annual changes in market share and the exchange rate for marketing expenditures. An excellent fit was obtained ( $R^2 = .996$ ) and the form of the relationship (linear in the logarithms of both variables) implied diminishing returns to marketing effort. Weinberg also demonstrated how to incorporate the model in a procedure to find the company's relative advertising effectiveness per dollar expended and, more importantly, to find the ad level which would maximize profit in the next year given a forecast of competitive activity and economic conditions.<sup>12/</sup>

What is perhaps most interesting about the Weinberg study is that it remains a rarity. It showed how quantitative advertising-sales relation-

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<sup>11</sup>Robert S. Weinberg, "Multiple Factor Break-Even Analysis: The Application of O.R. Techniques to a Basic Problem of Management Planning and Control," Operations Research, Vol. 4 (April 1956), pp. 152-186.

<sup>12</sup>Robert S. Weinberg, An Analytical Approach to Advertising Expenditure Strategy (New York: Association of National Advertisers, 1960).



ships could be developed and used to help set advertising budgets. However, there are no reports in the published literature of follow-up work.

The effect of advertising on competition has long been a subject of considerable interest to economists concerned with industrial organization and economic performance. The debate has centered around the issue of whether or not heavy advertising contributes to the raising of entry barriers and thereby leads to diminished levels of competition and the earning of monopoly profits. Schmalensee has reviewed a number of "direct tests" of the proposition that advertising adversely affects competition.<sup>13/</sup> These studies have involved the examination of correlations between advertising intensity and measures of either concentration or profitability. The data used in this work have been from cross-sectional samples consisting of both consumer and producer or industrial goods industries with advertising intensity measured by advertising-sales ratios obtained from Internal Revenue Service tabulations. Interpretation of the available evidence on the question of advertising's effect on competition remains controversial for a variety of reasons discussed by Schmalensee and others.<sup>14/</sup> However, one of these studies deserves mention here because it treated producer and consumer goods separately.

Miller examined the relation of profit rates to advertising intensity (advertising-sales ratios) plus two other variables, concentration (share of industry output produced by the largest firms) and diversity (the extent to which firms specialize in one industry or are diversified into other indus-

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<sup>13</sup> Richard Schmalensee, The Economics of Advertising (Amsterdam, Netherlands: North-Holland, 1972), pp. 219-228.

<sup>14</sup> Same reference as footnote 13, Chapter 7. Also see, Julian L. Simon, Issues in the Economics of Advertising (Urbana, Ill.: University of Illinois Press, 1970), Chapter 9.



tries).<sup>15/</sup> Multiple linear regressions of profit rates on these three variables were reported for a sample consisting of 71 "Internal Revenue Service minor industries" (roughly the three-digit standard industrial classification level of aggregation) which were manufacturers of producer goods. The profit measures used were industry annual accounting profits divided by assets or net worth averaged over four years (1958-59 through 1961-62). The concentration and diversification measures were derived from 1958 data while the advertising-sales ratios were averages of two years, 1958-59, and 1959-60. The regression coefficient for the advertising intensity variable was positive and statistically significant implying that those producer goods industries spending more on advertising tended to be those realizing higher rates of profitability. An unresolved issue here is whether profits determined advertising rather than vice versa.

Morrill has carried out a large body of relevant industrial advertising research sponsored by a dozen major industrial sellers.<sup>16/</sup> Some reports have appeared summarizing his results from studies involving 129 brands of 23 products drawn from five industries (utilities, commodities, electrical/electronic, metalworking, and chemical).<sup>17/</sup> Over 40,000 telephone interviews at 17,000 buying locations were conducted during the period from 1964 to 1969. In each case an attempt was made to locate one or more "brand-

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<sup>15</sup> Richard A. Miller, "Market Structure and Industrial Performance: Relation of Profit Rates to Concentration, Advertising Intensity, and Diversity," Journal of Industrial Economics, Vol. 28 (April 1969), pp. 104-118.

<sup>16</sup> John E. Morrill, "Industrial Advertising Pays Off," Harvard Business Review, Vol. 48 (March-April 1970), pp. 4-14ff.

<sup>17</sup> McGraw-Hill, "How Advertising Works in Today's Marketplace" (New York: McGraw-Hill, January, 1971) and "Advertising's Challenge to Management: A Second Report on the Morrill Study" (New York: McGraw-Hill, September 1971).



deciders" and assess purchase behavior, attitudes towards various brands, and magazine reading habits from which ad-exposure was inferred. Analysis of these data revealed a strong positive association between amount of advertising exposure and various measures of attitudinal and sales response. Figure 1 displays some of these relationships using average data for the five industrial classifications.

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FIGURE 1. Levels of Response Associated with Varying Amounts of Advertising and Salesmen's Calls.

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Morrill also found that dollar sales per salesman's call were much higher for calls made on customers who had been exposed to advertising, as compared to those who had not. Based on estimates of the average costs of an industrial salesman's call (\$50) and an advertising exposure (\$0.16), a subsidiary analysis showed that for the average brand studied, an index of personal selling expense as a percentage of sales declined from a level of 100 with no advertising exposures to a value of 74 for 30 exposures.<sup>18/</sup>

Taken at face value, Morrill's results constitute a strong case for industrial advertising, indicating that advertising pays off by making personal selling efforts more productive. However, certain methodological questions surrounding Morrill's studies deserve mention. Morrill's inferences about the effectiveness of advertising are derived from ex post comparisons of exposed and unexposed groups. It is well-known that this "pre-experimental" design is prone to several threats to internal and external validity.<sup>19/</sup> Morrill refers to a computer-based method for "match-

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<sup>18</sup> McGraw-Hill, September 1971, same reference as footnote 17, p. 6.

<sup>19</sup> Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago, Ill: Rand-McNally, 1963), pp. 12-14.



ing" the exposed and unexposed groups.<sup>20/</sup> Since Morrill's conclusions about advertising's impact depends upon the equivalence of such groups (exclusive of advertising exposure), the adequacy of this matching procedure is critical and it is unfortunate that details of the method have not been set forth in published accounts of these studies. Further, the practice of obtaining response data and self-reports of exposure in the same interview can lead to spuriously high associations between these two types of measures.<sup>21/</sup>

Nonetheless, the sheer bulk and consistency of the evidence from Morrill's studies is impressive, and by no means, can it be overlooked. The most important finding is that advertising used in conjunction with personal selling can reduce total selling costs. Morrill also refers to evidence of threshold effects in response to advertising. He suggests that less than a certain (small) level of exposure (a frequency of about 5 ad pages per year) seems to have no effect.<sup>22/</sup>

#### Attitudinal and Non-Sales Measures of Response

Research which focuses on attitudinal and other non-sales measures of response to industrial advertising is, as noted earlier, by far the most common kind undertaken. Proprietary studies of this kind are done routinely and occasionally partial accounts of them are made public.<sup>23/</sup> Seldom, however,

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<sup>20</sup> Morrill, same reference as footnote 16, p. 6.

<sup>21</sup> Campbell and Stanley, same reference as footnote 19, p. 67.

<sup>22</sup> Morrill, same reference as footnote 16, p. 14.

<sup>23</sup> See, for example, James W. Mason, "The Communication Effect of an Industrial Advertising Campaign," Journal of Advertising Research, Vol. 9 (March 1969), pp. 35-37, and Harry D. Wolfe, James K. Brown, and G. Clark Thompson, Measuring Advertising Results (New York: National Industrial Conference Board, 1962).



are these studies reported in sufficient detail to permit analysis and to provide a basis for generalization. The Morrill studies are somewhat of an exception in this regard. Both attitudinal and sales related measures of advertising response were obtained and at least at the aggregate level, there appears to be some consistency between the two.

Morrill's studies provide support for the widely held view that a principal function of industrial advertising is to make buyers more receptive to the advertiser's salesmen by creating a favorable impression of the firm as a supplier.<sup>24/</sup> This conception of how industrial advertising works constitutes one of the major rationales for image-building campaigns frequently undertaken by industrial marketers.<sup>25/</sup> Levitt conducted a controlled laboratory experiment which demonstrated the influence of company reputation on the effectiveness of industrial salesmen.<sup>26/</sup> A noteworthy feature of the study was that experienced business personnel (113 practicing purchasing agents and 130 engineers and scientists) were utilized as subjects. Participants were exposed to a ten-minute filmed sales presentation for a fictitious but plausible new product. Company reputation was manipulated by varying the name of the firm which the salesman was identified as representing. Immediately after viewing the film and again five weeks later subjects responded to a questionnaire which asked if they would recommend that the product be given further consideration by others in their organization and whether they themselves would favor adoption. As anticipated,

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<sup>24</sup> Wolfe et al., same reference as footnote 23, p. 7.

<sup>25</sup> See, for example, Wolfe et al., same reference as footnote 23, pp. 40-101.

<sup>26</sup> Theodore Levitt, Industrial Purchasing Behavior: A Study of Communications Effects (Boston, Mass: Division of Research, Graduate School of Business Administration, Harvard University, 1965).



the company reputation was found to influence the favorability of response on these measures. However, some unexpected differences were detected between the reactions of the purchasing agents and the technical personnel. The results seemed to indicate that a seller's reputation made a difference in a salesman getting a favorable first hearing for a new product with both purchasing and technical personnel. But when it came to making an actual purchasing decision, the advantage of reputation manifested itself with the technical personnel but not with the purchasing agents.

There has been some investigation of industrial buyers' usage of and/or preferences for different information sources in connection with studies of the adoption of new products.<sup>27/</sup> The results suggest a pattern of diminishing reliance on impersonal sources such as media advertising and increasing influence of salesmen and other personal sources as buyers move from the initial awareness stage through the evaluation and choice stages of the adoption process. In a study of marketing communication policies of ferrous components producers in the United Kingdom, Turnbull reports "a failure of the companies to understand that buyers may have different communication needs and channel preferences at different stages in the buying process, and in different industries."<sup>28/</sup>

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<sup>27</sup> See, for example, Frederick E. Webster, Jr., "Informal Communication In Industrial Markets," Journal of Marketing Research, Vol. 7 (May 1970), pp. 186-189; John A. Martilla, "Word-of-Mouth Communication in the Industrial Adoption Process," Journal of Marketing Research, vol. 8 (May 1971), pp. 173-178; Urban B. Ozanne and Gilbert A. Churchill, Jr., "Five Dimensions of the Industrial Adoption Process," Journal of Marketing Research, Vol. 8 (August 1971), pp. 322-328.

<sup>28</sup> P. W. Turnbull, "The Allocation of Resources to Marketing Communications In Industrial Markets," Industrial Marketing Management, Vol. 3 (October 1974), pp. 297-310.



## Advertising Cost Studies

The preceding discussion has focused on the matter of how industrial buyers and markets respond to advertising. In this section we examine research related to the other key element that enters into advertising expenditure discussions, cost considerations.

The issue of whether or not there are economies of scale in advertising is one aspect of the behavior of marketing costs that is highly relevant not only to determining advertising expenditure levels but also to allocating these funds among media and markets and over time. The occurrence of economies of scale in advertising implies that over some range of advertising, an additional unit of advertising input produces a greater marginal return than the previous equal increment yielded. Schmalensee distinguishes between two sources of varying returns to scale in advertising.<sup>29/</sup> The first he terms "technical economies" to refer to differences in the effectiveness of successive exposures. The data from Morrill's studies plotted in Figure 1 would seem to indicate essentially constant returns to scale and hence reflect the absence of any technical economies. The second variety are "pecuniary economies" which may arise if the cost of advertising exposures changes with the total number of exposures employed such as might occur as a consequence of the media offering quantity discounts. A profit-maximizing firm would not knowingly choose to advertise at a level where there were increasing returns to scale because it would be profitable to spend more.

A certain amount of discussion of the subject of economies of scale in advertising is found in the economic literature. Increasing returns to scale

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<sup>29</sup> Schmalensee, same reference as footnote 13, pp. 231-232.



constitute one mechanism whereby advertising might contribute to raising barriers to entry. The available empirical studies tend to be based on cross-sectional samples consisting either entirely of consumer goods industries or a combination of consumer and producer goods fields. Only occasionally has the latter distinction been recognized in the analyses reported. Stigler found a non-significant rank order correlation of  $-.059$  between firm size and the advertising-sales ratio from a set of producer-goods industries.<sup>30/</sup> Using 1960 IRS data, Simon and Crain calculated the simple correlation between mean firm size and mean advertising-sales ratio across size categories within each of 109 industries.<sup>31/</sup> About half the correlation coefficients were positive and half negative. Presumably the sample consisted of numerous producer goods industries or categories thereof.

These two studies are consistent with the results of most of the economic research of this kind in failing to support the notion of economies of scale in advertising.<sup>32/</sup> However, some contrary findings have turned up in cross-sectional studies of marketing costs of individual firms. Turnbull obtained information on marketing communications expenditures and sales for a set of firms producing ferrous components whose combined output accounted for 51 per cent of the industry total in the United Kingdom.<sup>33/</sup> He found a rank order correlation of  $-.512$  between firm size (sales) and the ratio of marketing communications expenditures to sales. Although based on only 11 observations, the coefficient approaches significance at the .05 level.

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<sup>30</sup> George J. Stigler, "The Economies of Scale," Journal of Law and Economics, Vol. 1 (October 1958), p. 66.

<sup>31</sup> Julian L. Simon and George H. Crain, "The Advertising Ratio and Economies of Scale", Journal of Advertising Research, Vol. 6 (September 1966), pp. 37-43.

<sup>32</sup> For a review, see Schmalensee, same reference as footnote 13, pp. 228-237 and Simon, same reference as footnote 14, Chapter 1.

<sup>33</sup> Turnbull, same reference as footnote 28.



Bailey has mentioned finding evidence of economies of scale in a 1969 study of manufacturers' marketing costs conducted by the Conference Board involving data obtained for 828 products, a large proportion of which were industrial goods.<sup>34/</sup> Although detailed results were not presented, Bailey states that "the large-volume marketing unit dealing either in consumer or industrial goods generally gives up less of its sales dollar to the cause of marketing than does a small-volume competitor."<sup>35/</sup> He goes on to observe that "there is a certain point at which differences in sales volume become "critical" and indicates that for industrial products that this point is "just below \$30 million."<sup>36/</sup>

In the earlier discussion of Morrill's studies, we noted that his results indicated a strong interaction effect between personal selling and advertising which implied that application of appropriate amounts of advertising could reduce total selling expense. Evidence of this phenomenon was found in a study of industrial firms' marketing costs carried out by McGraw-Hill and reported by Kolliner.<sup>37/</sup> In 1961 marketing cost data were obtained via a mail questionnaire from 893 industrial advertisers. The sample contained firms of varying size (annual sales volumes ranging from less than \$1 million through more than \$25 million) from three broad industrial product categories (machinery, materials, and equipment and supplies). The key

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<sup>34</sup> Earl L. Bailey, "Manufacturers' Marketing Costs," Conference Board Record, Vol. 8 (October 1971), pp. 58-64.

<sup>35</sup> Bailey, same reference as footnote 34, p. 60.

<sup>36</sup> Bailey, same reference as footnote 34, p. 60.

<sup>37</sup> Sim A. Kolliner, Jr., "New Evidence of Ad Values," Industrial Marketing, Vol. 48 (August 1963) pp. 81-84. Also see, McGraw-Hill Laboratory of Advertising Performance, "Advertising and The Cost of Selling " (New York: McGraw-Hill, July 1964).



cost variable studied was "Total Sales Expense" (expressed as a percentage of sales) which consisted of two main elements: "Advertising and Promotion" and "Direct Selling Costs" (salesmen's compensation and expenses). Fixed costs and overhead charges associated with these activities were excluded. The sample observations were grouped into six categories defined by different proportions of Total Sales Expense spent on Advertising and Promotion. The average Total Sales Expense (as a percentage of sales) was calculated for each of the six groups. Figure 2 presents a plot of the data reported. Consistent with the view that advertising can increase the efficiency of personal selling, it was found that as the proportion of Total Sales Expense spent on advertising and promotion increased, total Sales Expense as a percentage of sales tended to decline.

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FIGURE 2. Relative Selling Costs and Advertising-Sales Promotions Allotments.

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Interpreting this relationship is somewhat hazardous inasmuch as it was formed by grouping and averaging the original observations on the two variables which were ratios whose numerators and denominators contain common elements. It is unfortunate that more disaggregated analyses were not undertaken but some additional results were reported which tend to confirm the basic notion that advertising contributes to marketing efficiency. The relationship between firm size (annual sales volume) and Total Sales Expense as a percentage of sales was examined separately for firms which had expended "high" (more than 20 per cent) and "low" (less than 20 per cent) proportions of Total Sales Expense on advertising and promotion. Figure 3 shows these relationships which are also based on averages of grouped data.



For all four size categories, Total Sales Expense (as a percentage of sales) was less with "high" advertising and promotion than with "low." Note that the results indicate economies of scale. These differences in relative Total Sales Expense associated with high versus low reliance on advertising and promotion were also shown to exist when the data were analyzed for each of the three product categories separately. Further, the same pattern of results was observed in data from a second, smaller study of 227 firms conducted by McGraw-Hill in 1963.<sup>38/</sup> Thus, we find that the results from these cost studies appear consistent with the research dealing with advertising response reviewed above in indicating that industrial advertising can serve to enhance the effectiveness of personal selling efforts.

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FIGURE 3. Relative Selling Costs and Company Size for High and Low Advertising-Sales Promotion Allotments

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### Budgeting Practices

In light of the dearth of organized empirical knowledge about market response to industrial advertising, management in this field must ordinarily depend upon some blend of judgment, experience with analogous situations, and simple rules-of-thumb guidance in setting budgets. Heuristics like "X per cent of expected sales" and the "objective and task" method are the principal approaches to budgeting which industrial advertisers report they utilize. Among 557 subscribers to Industrial Marketing who responded to a 1968 mail questionnaire, the following distribution of budgeting practices was found:<sup>39/</sup>

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<sup>38</sup> McGraw-Hill, same reference as footnote 37.

<sup>39</sup> Murray Harding, "Project Future: More Advertisers Mad than Glad about Budget Policy," Industrial Marketing, Vol. 53 (August 1968), p. 58.



<u>Method</u>	<u>% Using</u>
% of Sales	24.8
Task	25.6
Arbitrary	27.7
Other	11.9
	<hr/> 100.0

Heavy reliance on rules-of-thumb and the task method has also been frequently reported in other budgeting studies covering firms outside the industrial marketing sector.<sup>40/</sup> However, in recent years measurement programs and models have made some inroads on budgeting practices in the consumer goods field<sup>41/</sup> and it is surprising to find that Weinberg's work is the only documented account of a comparable analytical method for budgeting industrial advertising that has appeared in the literature.<sup>42/</sup>

#### Heuristics

Per cent-of-sales decision rules are a pervasive influence in setting advertising budgets. Schmalensee has analyzed the conditions under which it might be optimal for a monopolist or oligopolist to maintain a constant advertising-to-sales ratio.<sup>43/</sup> However, there have been no empirical inves-

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<sup>40</sup> See, for example, David L. Hurwood, "How Companies Set Advertising Budgets," The Conference Board Record, Vol. 5 (March 1968), pp. 34-41; Albert W. Frey, How Many Dollars for Advertising (New York: Ronald Press, 1955); Walter Taplin, "Advertising Appropriation Policy," Economica, Vol. 26, (August 1959), pp. 227-239.

<sup>41</sup> Seymour Banks, "Trends Affecting the Implementation of Advertising and Promotion," Journal of Marketing, Vol. 37 (January 1973), p. 24.

<sup>42</sup> Weinberg, same reference as footnote 11.

<sup>43</sup> Schmalensee, same reference as footnote 13, Chapter 2.



tigations to demonstrate that the behavior of industrial advertisers' expenditures indeed are sensitive to key limiting requirements (e.g., the constancy of certain demand elasticities) of such a policy. The weaknesses of per cent-of-sales decision rules are well-known<sup>44/</sup> but the most fundamental objection is that they implicitly make advertising a consequence rather than a determinant of sales and profits and can easily give rise to dysfunctional policies. For example, budgeting advertising as a percent of expected sales would ordinarily lead to reduced expenditures in an economic downturn. However, a correlational study by the Buchen organization indicated that industrial advertisers who maintained their expenditures during recession periods realized better sales performance than those who did not.<sup>45/</sup> Nonetheless, some mechanism to control advertising expenditures is required and in the absence of concrete and current measurements of advertising results, top management frequently establishes some per cent-of-sales or profit as a budgeting guideline.<sup>46/</sup>

An example of how an empirical rule-of-thumb is used as a guideline in setting budgets is provided by DeWolf, who used the results from the aforementioned McGraw-Hill study of industrial firms' marketing costs to establish a "yardstick that can apply to advertising budgets, present or

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<sup>44</sup> See, for example, Philip Kotler, Marketing Management, 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1972), pp. 669-670.

<sup>45</sup> Buchen Advertising, Inc., Advertising In Recession Periods: 1949, 1954, 1958, 1961 -- A New Yardstick Revisited (Chicago, Ill.: Buchen Advertising, 1970).

<sup>46</sup> See, for example, George A. Percy, "How Kendall Prepares Its Advertising Budget," in Richard J. Kelly, ed., The Advertising Budget (New York: Association of National Advertisers, Inc., 1968), pp. 52-54.



proposed, to see if they are of the proper magnitude."<sup>47/</sup> DeWolf recommended that if a company wanted to take full advantage of the potential of advertising, it should spend more than 20% of its marketing budget on advertising. As he puts it, "the magic figure seems to be 20% -- until you get above 20%, you are in the lower half of all companies in selling efficiently -- and you can safely go up to at least 33%."<sup>48/</sup> Figure 4 sets forth the heuristic described by DeWolf.

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FIGURE 4. A Heuristic for Budgeting Industrial Marketing Communications

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Much could be learned from a study of the determinants of industrial advertising expenditures. The question of why "advertising intensity" (measured by the ratio of advertising to sales) varies across product categories has attracted some attention from economists. Advertising is analyzed from the perspective of buyers' information requirements and producers' information dissemination costs. Telser, for example, has argued that differences in advertising intensity can be explained in terms of a number of product and market characteristics such as price elasticity, market size, number of sellers, and product differentiation.<sup>49/</sup> Several empirical studies have been reported where advertising-sales ratios have been related to various product characteristics including new vs. established, durable vs. non-durable, purchase frequency, and price.<sup>50/</sup> These

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<sup>47</sup> John W. DeWolf, "A New Tool for Setting and Selling Advertising Budgets," paper presented at the Eastern Regional Meeting of the American Association of Advertising Agencies, November 7, 1963, p. 21.

<sup>48</sup> Same reference as footnote 47.

<sup>49</sup> Lester G. Telser, "Some Aspects of the Economies of Advertising," Journal of Business, Vol. 41 (April 1968), pp. 166-173.

<sup>40</sup> For a review, see Schmalensee, same reference as footnote 13, pp. 18-20.



investigations have typically employed cross-sectional samples of industries rather than of individual firms or products. Unfortunately from the present point of view, this work appears to have been focused exclusively on consumer goods industries with no comparable analyses of data for industrial goods.

Other heuristics besides the per cent-of-sales variety such as "matching" competitive expenditures also frequently enter into budgeting decisions. All share some common characteristics in that they serve as a management control device but are difficult to justify. Reliance on simple rules-of-thumb by industrial marketers appears to have declined over time. A 1939 survey of industrial advertising budgeting practices reported in Borden showed greater utilization of such methods than indicated by the 1968 study mentioned above.<sup>51/</sup>

#### Task Method

The task method focuses on communication rather than sales effects of advertising and develops a budget by summing estimates of the costs of activities and programs required to accomplish the particular functions assigned to advertising. The essential steps involved in applying the method are these:

- 1) Establish specific marketing objectives for the product in terms of sales volume, market share, profit contribution, etc. and target market segments.
- 2) Assess the communication functions that must be performed to realize the overall marketing objectives and determine the

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<sup>51</sup> Neil H. Borden, The Economic Effects of Advertising (Chicago, Ill.: Richard D. Irwin, Inc., 1942), p. 722.



role of advertising and other elements of the communication mix in performing these functions.

- 3) Define specific goals for advertising in terms of the levels of measurable communication response required to achieve marketing objectives.
- 4) Estimate the budget needed to accomplish advertising goals.

Underlying the task method is the notion that the influence of advertising on buyers is manifested through some type of hierarchy of effects ranging from creating product or company awareness and knowledge through developing favorable supplier or product attitudes and preferences. The task method and the hierarchy of effects concept have a long history in advertising but implementation of these ideas grew markedly in the early 1960's following the appearance of Colley's oft-cited volume on "DAGMAR."<sup>52/</sup> Numerous examples of applications of this version of the task method and the accompanying use of intermediate measures of communication effectiveness in industrial advertising have been discussed in the published literature.<sup>53/</sup> It is interesting to note that Industrial Marketing's 1968 survey found that users of the task method were more likely to be satisfied with their budgeting practices than respondents who relied on other approaches.<sup>54/</sup>

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<sup>52</sup> Russell H. Colley, Defining Advertising Goals for Measured Advertising Results (New York: Association of National Advertisers, 1961).

<sup>53</sup> William P. Raines, "Setting Advertising Goals for Industrial Products," in Richard J. Kelly, ed., The Advertising Budget (New York: Association of National Advertisers, Inc., 1968), pp. 47-51; Patrick J. Robinson and David J. Luck, Promotional Decision Making (New York: McGraw-Hill, 1964), pp. 168-177; Saul S. Sands, Setting Advertising Objectives (New York: National Industrial Conference Board, 1966); and Wolfe et al. same reference as footnote 23.

<sup>54</sup> Harding, same reference as footnote 39, p. 68.



The practical difficulty of isolating advertising's impact on sales plus recognition of advertising's function to be one of communications have motivated adoption of the task method and accompanying measures of intermediate response. The latter provide a basis for some modicum of management control to be exercised over advertising operations. However, the great stumbling block in using this approach as a planning tool is that it requires knowledge about how levels of expenditures and various communication response measures are related and how the latter are linked to the purchase behavior which is relevant to the attainment of marketing goals.<sup>55/</sup> The existence and nature of such relationships are highly controversial matters.<sup>56/</sup> Progress is being made in understanding and using these relationships for purposes of planning and controlling marketing communications but these developments appear to have occurred largely in the consumer field.<sup>57/</sup>

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<sup>55</sup> See, for example, the papers on "Advertising Research -- DAGMAR Revisited," in New Directions in Marketing, Frederick E. Webster, Jr., ed. (Chicago: American Marketing Association, June 1965), pp. 333-358.

<sup>56</sup> Kristian S. Palda, "The Hypothesis of a Hierarchy of Effects: A Partial Evaluation," Journal of Marketing Research, Vol. 3 (February 1966), pp. 13-25; and Michael L. Ray, "Marketing Communications and the Hierarchy of Effects," in Peter Clarke, ed., New Models for Communications Research (Beverly Hills, Calif.: Sage, 1974), pp. 147-176.

<sup>57</sup> Michael L. Ray, "A Decision Sequence Analysis of Developments in Marketing Communications," Journal of Marketing, Vol. 37 (January 1973), pp. 29-38.



## Conclusions

A review of the available literature provides indications that:

- (1) industrial advertising and personal selling can perform complementary and/or synergistic roles;
- (2) increasing the share of total selling expense spent on advertising may be associated with lower selling costs relative to sales;
- (3) economies of scale may exist for industrial advertising.

These phenomena carry major implications for expenditure policy but the body of empirical evidence relating to them is presently very limited and can only be regarded as suggestive. The study of the process and effects of industrial advertising has not yet progressed to the point where it can offer much guidance to industrial advertisers faced with specific expenditure decisions.

The lack of knowledge about industrial advertising response is reflected in current budgeting practices. Simple heuristics and the task method are the most common approaches firms use to determine industrial advertising expenditures. Both methods serve the purpose of providing management with a mechanism for controlling advertising spending but there are good reasons for believing that these methods can also lead to inappropriate expenditures policies in many instances.

While this review clearly points to the need for a better understanding of how, and under what conditions industrial advertising is effective, it is by no means obvious that the research required to build such knowledge will accumulate faster in the future than it has in the past. The small size of most industrial advertising budgets makes it doubtful that there will be any upsurge of research activity in the form of major field studies of advertising response. Are there other productive research paths leading



to shorter-run payoffs that might be pursued? It seems likely that opportunities exist for useful econometric work concerned with developing response functions using data bases from individual firms. Another potentially fruitful direction is to attempt to identify and exploit managers' existing knowledge about the effectiveness of industrial advertising. Bowman's "management coefficients" theory of decision making and the empirical support that has been developed for it provide the rationale and precedent for such efforts.<sup>58/</sup>

Bowman suggests that through experience, managers learn what the critical variables are that affect their decisions and thereby come to acquire reasonable implicit models of these problems. However, in a specific decision situation, they may respond selectively to particular information cues and organizational pressures. Thus Bowman argues that experienced managers make good decisions on the average but may display high variance in their behavior. He contends that this "erratic" element or variability (around the average) in decision making is more important than "bias" -- deviation of the management average from the theoretical optimum. From this descriptive view of human information processing capabilities, it follows that managers' decisions could be improved by making them more consistent to reduce this variability. In a series of studies of production scheduling decisions, Bowman and his students have shown that significant cost savings could be realized by consistently applying decision rules inferred from managers' own past behavior.<sup>59/</sup> Furthermore, the results obtained using

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<sup>58</sup> E. H. Bowman, "Consistency and Optimality in Managerial Decision Making," Management Science, Vol. 9 (January 1963), pp. 310-321.

<sup>59</sup> Same reference as footnote 58. Also see, Howard Kunreuther, "Extensions of Bowman's Theory of Managerial Decision-Making," Management Science, Vol. 15 (April 1969), pp. B-415-439.



the decision rules based on the "management coefficients" compared favorably with those obtained by optimizing a statistical cost function.

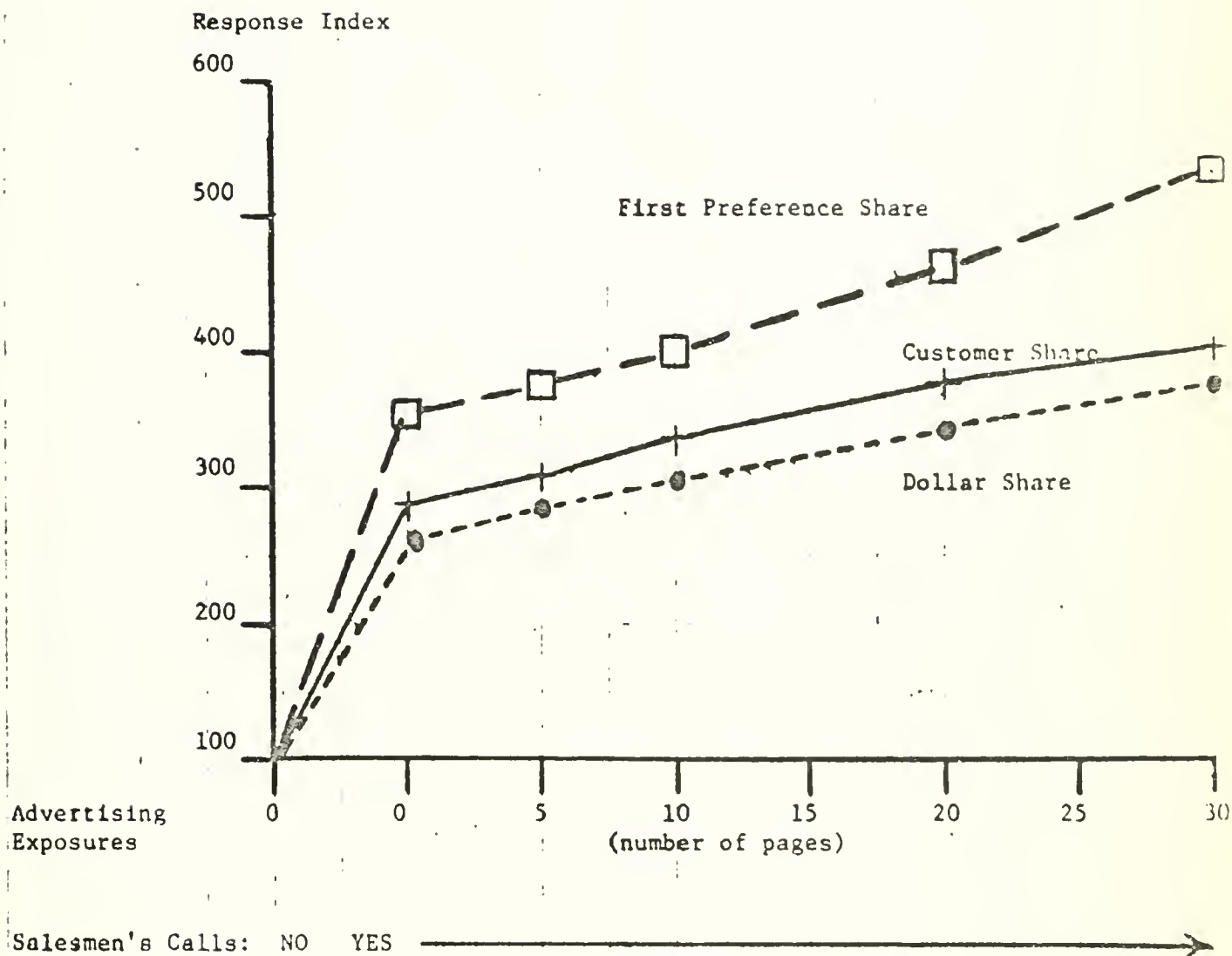
The budgeting of industrial advertising appears to be a case where Bowman's concepts might well apply. Certainly, doubts and uncertainty about advertising impact and the nature of current budgeting practice would suggest that these decisions are subject to substantial variability if not bias. A study of industrial marketing communication decision rules and their determinants in the spirit of Bowman's work is presently underway using a cross-sectional sample of industrial products.<sup>60/</sup> Like Bowman, the goal of this work is "pragmatic rather than utopian in that it offers one way of starting with the managers' actual decisions and building on them to reach a better system."<sup>61/</sup> It would be presumptuous to make strong claims for such an investigation at this time but it can be expected to add to our knowledge about industrial advertising budgeting practice and to provide a basis for developing new forms of budgeting norms and guidelines.

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<sup>60</sup>For details of the study, see Gary L. Lilien, "How Many Dollars for Industrial Advertising? Project ADVISOR," Working Paper 735-74, Sloan School of Management, M.I.T., September, 1974; and John D. C. Little and Gary L. Lilien, "How Much for Industrial Advertising?" Talk before the Advertising Research Foundation Conference, New York, November 18, 1974.

<sup>61</sup>Bowman, same reference as footnote 58, p. 310.



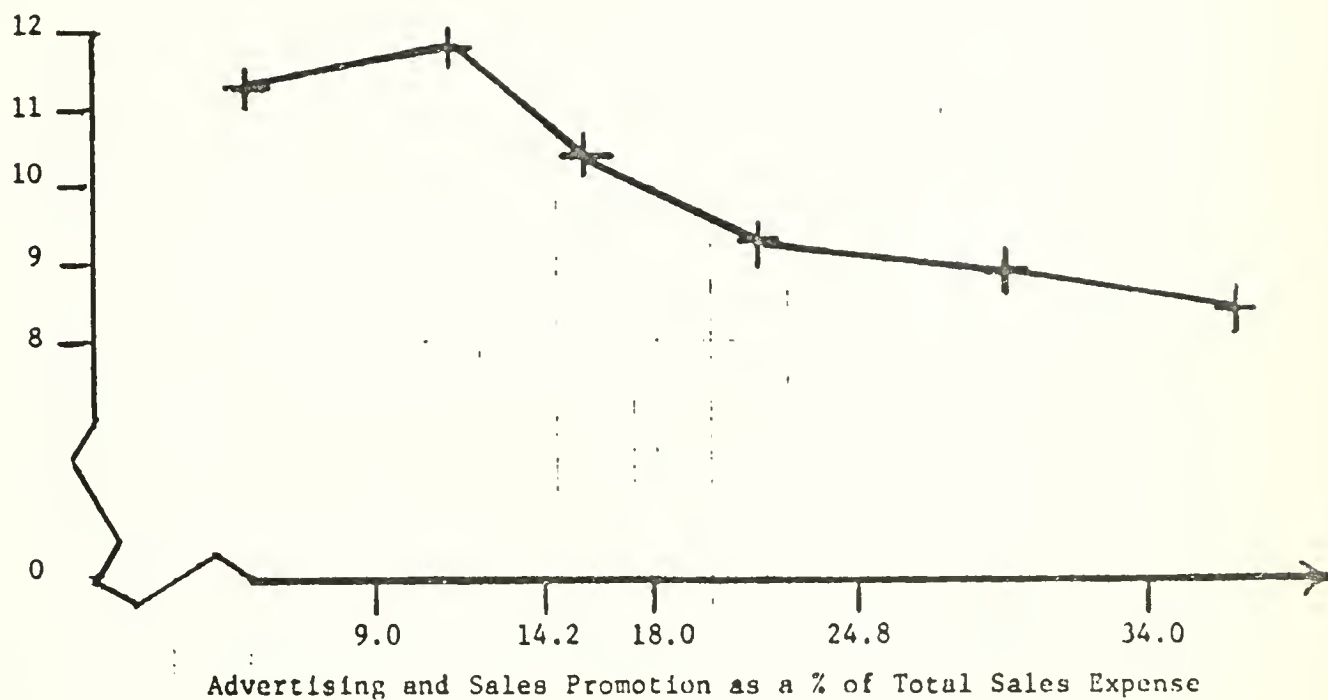


Source: Plotted from data presented in "Advertising's Challenge to Management: A Second Report on the Morrill Study," (New York: McGraw-Hill, September, 1971), p. 8.

Figure 1. Level of Response Associated with Varying Amounts of Exposure to Advertising and Salesmen's Calls



Total Sales Expense  
as a % of Sales

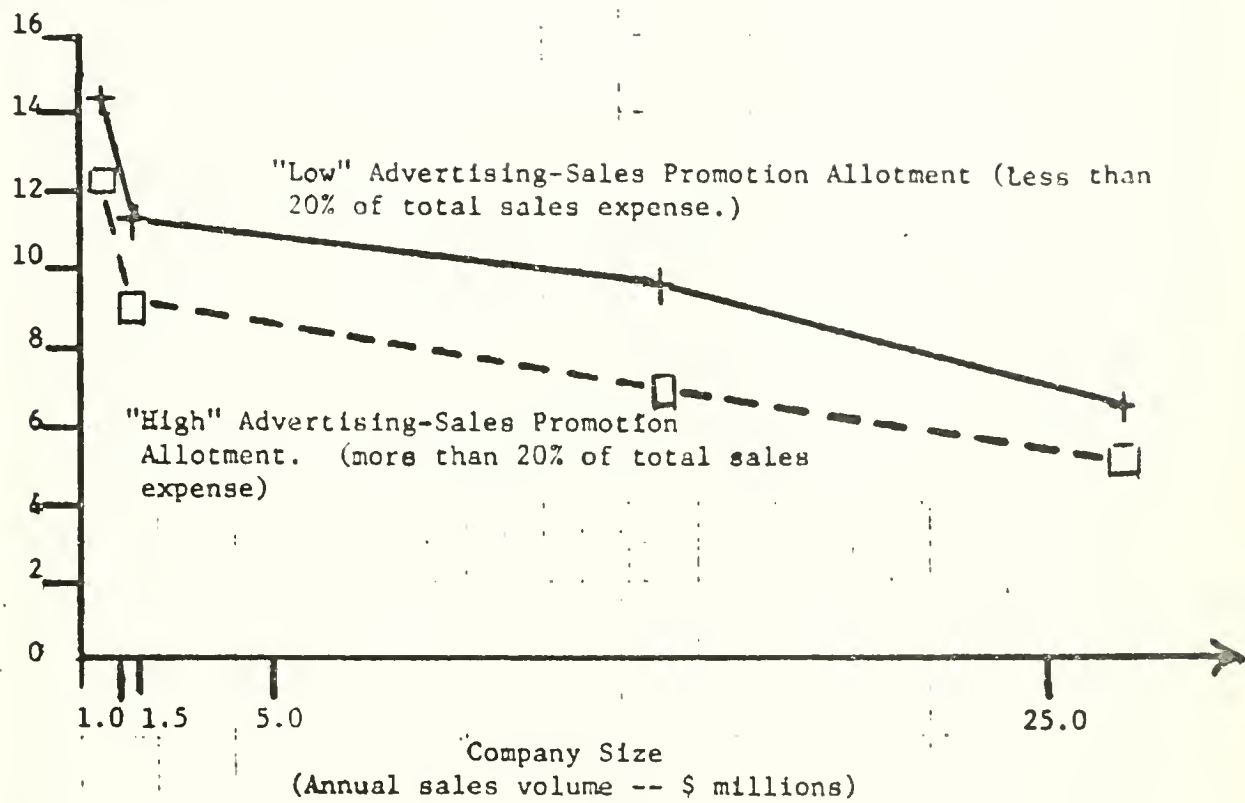


Source: Plotted from data presented in Sim. A. Kolliner, "New Evidence of Ad Values," Industrial Marketing, Vol. 48 (August 1963), p. 82.

Figure 2. Relative Selling Costs and Advertising-Sales Promotion Allotments



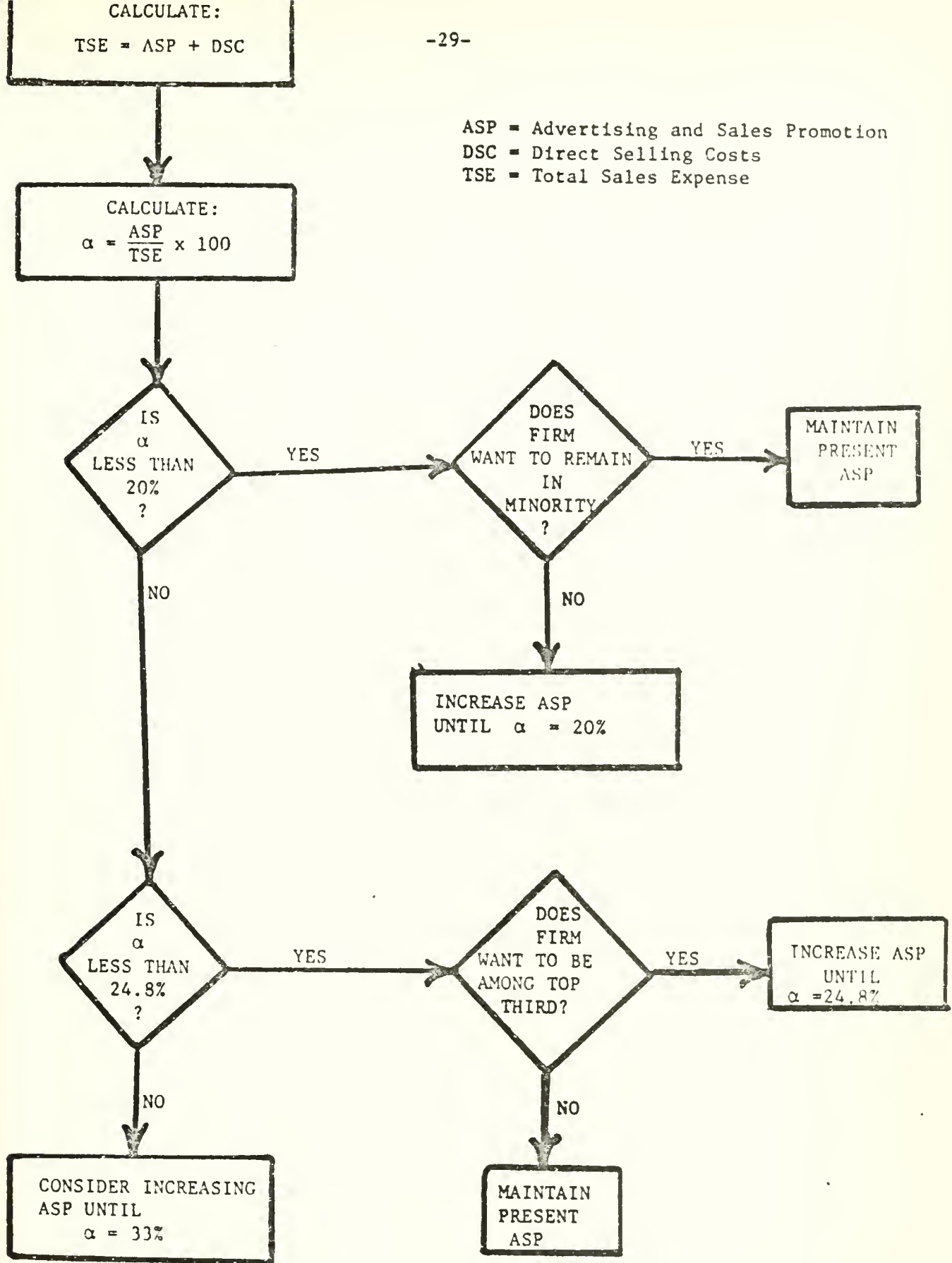
Total Sales Expense  
as a % of Sales



Source: Plotted from data presented in Sim A. Kolliner, "New Evidence of Ad Values," Industrial Marketing, Vol. 48 (August 1963), p. 82.

Figure 3. Relative Selling Costs and Company Size for High and Low Advertising-Sales Promotion Allotments





Source: Developed from John W. DeWolf, "A New Tool for Setting and Selling Advertising Budgets," Paper presented at the Eastern Regional Meetings of the American Association of Advertising Agencies, November 7, 1963, p. 5

Figure 4. A Heuristic for Budgeting Industrial Marketing Communications





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